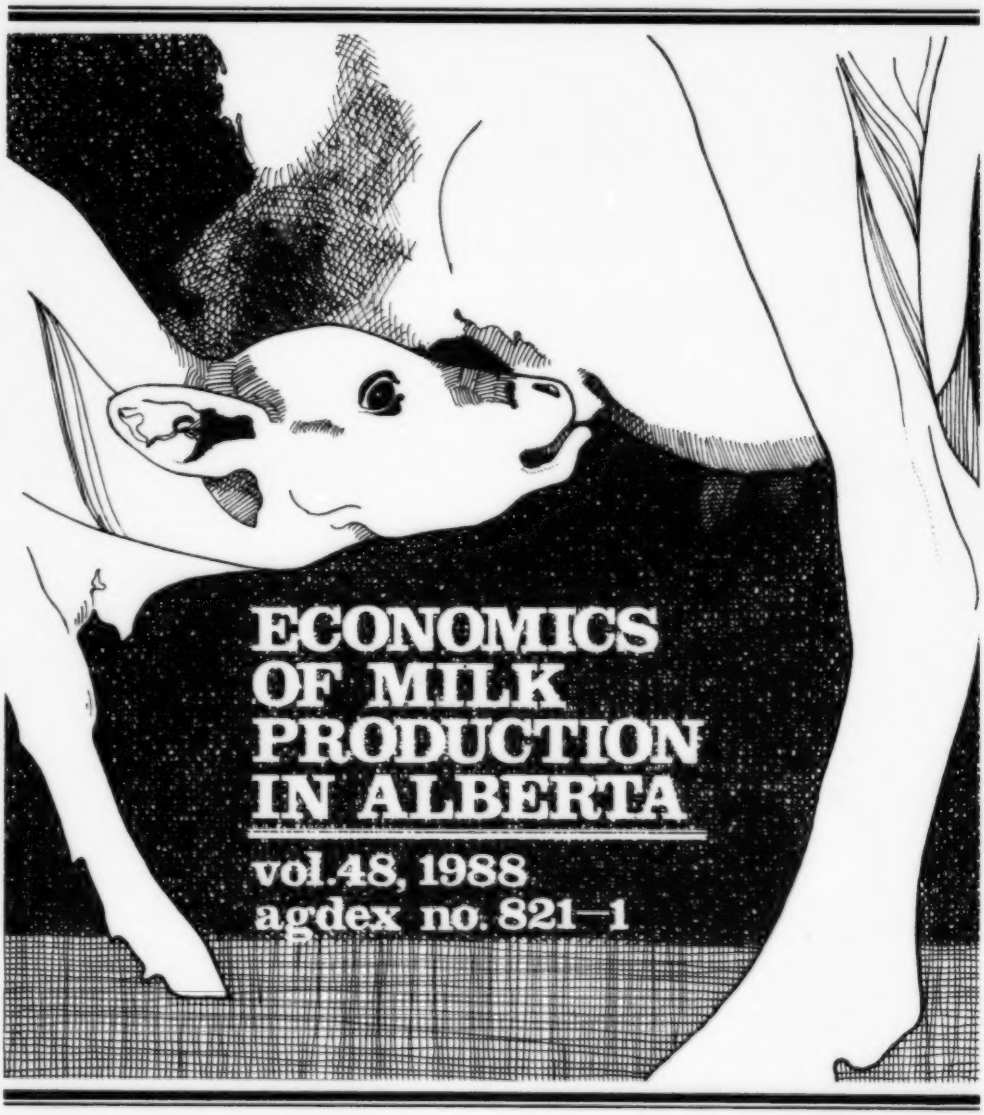

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ECONOMICS OF MILK PRODUCTION IN ALBERTA, 1988

Volume 48

By
Rudy Susko

Production Economics Branch
Economic Services Division
Alberta Agriculture
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FOREWORD

Pricing of fluid milk in Alberta is regulated by the Public Utilities Board (PUB). The Production Economics Branch conducts an annual study of dairy production costs and returns in Alberta to assist the PUB in administering fluid milk prices. This annual Dairy Cost Study was introduced during World War II and is now recognized by dairymen, consumers and the PUB as the primary reference for setting fluid milk prices.

In addition to the Dairy Cost Study, the branch had developed a computerized formula which monthly monitors producer costs. The formula enables the PUB to make more frequent adjustments to the producer price in response to changes in production costs during the year. Further adjustment to the producer price can be made when the annual Dairy Cost Study is completed.

The cost of producing fluid milk increased by 6 percent in 1988 in contrast to less than 1 per cent in 1987. An increase in feed prices was mostly responsible for this change. Due to corresponding increases in milk prices, the return to equity remained relatively unchanged at 15.9 per cent, compared to 16.5 percent in 1987.

Dr. Carlyle Ross, Head
Production Economics Branch

NOTE

This report was prepared from farm records of a selected number of fluid milk producers in Alberta who voluntarily participated in this project. Their participation was greatly encouraged by the Alberta Fluid Milk Producers' Association. the Alberta Dairy Control Board provided the financial compensation to the participating producers. Allan Presiznuk from Production Economics Branch collected and assisted with the computerization of the farm data; he also maintained personal contact with the producers throughout the year.

Rudy Susko

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I. INTRODUCTION

This study is an annual economic analysis of milk production on Alberta farms. Prior to 1974 the findings of these studies were used as the documented evidence at the Public Utilities Board hearings to set the producer price. Although a formula pricing system was adopted in November 1974, the significance of this study in overall pricing mechanism remains undiminished.

More specifically the objectives of the study are:

- to provide a continuing account of the costs and economic conditions encountered in the production of fluid milk in Alberta.
- to annually monitor the performance of the fluid milk formula pricing.
- to use the findings as a basis for the revision in the formula price.
- to provide the data for extension use, for example, farm management.
- to provide the participating dairy farmers with a personal business analysis for management purposes.

The cost of production account is a vital economic indicator in milk pricing because of the supply management nature of the industry.

II. METHOD OF ANALYSIS

Many approaches may be used to establish the cost of production on the farm. The approach taken in this study is to show the actual cost outlays taken from the farm records for a given production year. A computer program is utilized to summarize the data and calculate the weighted group averages.

The study emphasizes the overall provincial situation supported by the regional data. Since the study is annual and ongoing, the current year is compared with the previous year to make the results more meaningful. Using this approach, the information is expressed in production units such as per hectolitre of milk and per cow.

Preliminary quarterly analyses are made during the year to observe seasonal effects. However, emphasis is on the full year's operation.

1. Enterprise Identification -- There are many accounting approaches for calculating the farm cost of producing fluid milk. Some use the total farm approach, with dairy costs intermingled with others. Others use the different imputed cost items such as operating interest cost or management charge. In Alberta the dairy enterprise is defined as all activities associated with milking cows, dry cows and young dairy stock. In most cases, the dairy operator raises his own feed; the inputs of production are allocated to the dairy enterprise and the total farm according to the actual use. Consequently, the final costs of producing milk are the true costs associated only with milk production.

2. Inventory adjustment -- Since the cost of raising young dairy stock is included in the cost of milk production, the total income includes net cattle sales and net inventory increases to show the herd growth. The cattle inventory increases are determined by subtracting the beginning year inventory from the year-end inventory. The gross income is thus composed of milk sales and inventory adjustment. If the inventory adjustment per hectolitre of milk is excluded from the income the result is the blend price and subsidy received for milk.

3. Home Grown Feed -- The hay grown on the farm and fed to dairy livestock is valued at regional values of hay in the stock on the farm; feed grain is valued at elevator prices provided by the Alberta Grain Commission. Although hay and grain could be grown on the same farm, both are considered to be purchased from the crop enterprise. The total value of home grown feed is determined by applying the regional price to the actual quantity fed. The procedure adequately compensates for the production cost of growing home feed. The cost of purchased feed is accepted at the actual value spent each month.

4. Value of Investment and Depreciation -- The cost of production and other relevant data from this report are supposed to reflect the average conditions in the industry. The value of depreciation is based on the original value of buildings and machinery. There is also a need to estimate the current market value of the facility to determine the equity position. The market value is computed from the original value of dairy capital by updating with the inflation factors and then depreciating according to the number of years in use. This value is used for calculating the return to equity. The age of the facility is indicated by the sample of participating producers representing the total industry. The farmland is not considered as a dairy investment. Only the acreage for pasture, dairy buildings and corral location is included in the dairy. The dairy livestock inventory is valued at the prevailing market prices at the beginning of the year.

5. Imputed Costs -- There are two basic alternatives to value the economic well being of the farm enterprise. A. to determine the return to family labour including the operator labour input, and B. to determine the return to equity invested in each particular enterprise. The methods, as identified in Table 1, are quite compatible and in each case some major assumptions must be made. In alternative A where the residual is return to family labour, the equity interest must be imputed in order to arrive at the total cost of production. The actual residual can then be measured in terms of dollars per hour of labour. On the other hand, using alternative B, the value of family

labour must be imputed since there is usually no value attached to this input.

In this study the principles of the alternative B are used, i.e. the objective is to determine the percentage return to equity. The imputed value of family labour is included in the operating or variable costs. This is more practical for a number of reasons: i) incorporated farms usually allocate total labour expenses including family, ii) in reality the operator is using money during the year for living expenses and thus the imputed family labour value is compensating for this, iii) imputed interest or opportunity cost on equity, used in alternative A is a controversial issue in a period of persistent inflation of capital assets. The charges for rent are included in the cost of capital. The capital cost in this context represents the cost of ownership of resources. If resources are rented there is a charge for their use; on the other hand, if resources are owned the owner must bear the cost of depreciation and interest on debt. For group averages such classification of variable (or operating) and capital cost is very suitable.

a) Operator and family labour: the operator's actual labour may vary from almost nil on some dairy farms to the total input of labour on others. Our procedure has been to obtain a statement of the operator's labour in hours per month, then apply the rate paid for full time dairy labour (including room and board).

   In determining the hourly value, 2,500 hours is considered to be the working time for one man-equivalent in a 12-month period. By this method, it is felt that the process of valuing the operator's labour is equitable. This method is preferred over leaving it as a residual because of the great variability in labour time between operators. Family labour is evaluated similar to the above, but with different wage rates according to age and working responsibilities.

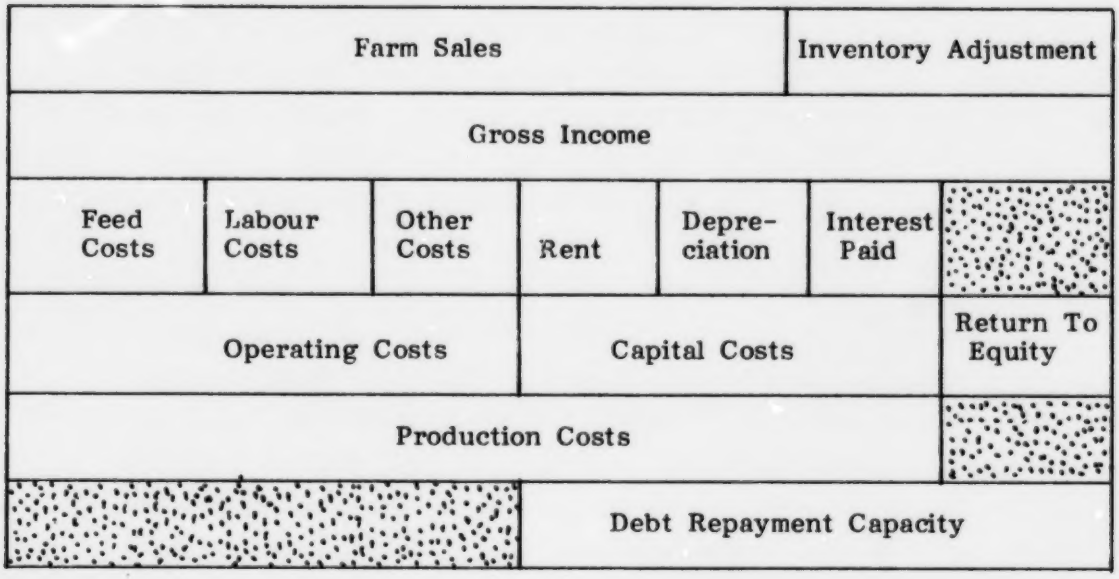
TABLE 1 ALTERNATIVE RETURNS

A. LABOUR	B. CAPITAL
a) Gross Income	a) Gross Income
Feed	Feed
Other	Other
Hired Labour	Hired Labour
	Family Labour (Imputed)
b) Operating cost	b) Operating Cost
Rent	Rent
Depreciation	Depreciation
Paid Interest	Paid Interest
Equity Interest (Imputed)	-
c) Capital Cost	c) Capital Cost
Return to Family Labour	Return to Equity

b) Interest on Capital: the actual interest paid on existing liabilities is included in the capital cost. To obtain this value, the participating producers were asked to report their outstanding liabilities and the interest rates they paid. This method is more accurate than reporting the annual interest payment sum. The total operating cost, plus the capital cost, account for total enterprise outlays and if subtracted from the gross income, the bottom line residual is the return on equity. The return on equity is not imputed but is left as a residual to measure the economic well-being of a farmer . If this residual is expressed as a percentage of the equity capital, then the actual return on equity could be compared with some alternative opportunity income which could be expected from Canada Savings Bonds or term deposits.

6. The production cost concept: The concept of cost accounting in farming is not the same in all provinces. In Alberta, the following production cost concept is used:

DIAGRAM 1


Farm Sales
Inventory Adjustment
Gross Income
Feed Costs
Labour Costs
Other Costs
Rent
Depre-ciation
Interest Paid
Operating Costs
Capital Costs
Return To Equity
Production Costs
Debt Repayment Capacity

III. DATA COLLECTION

In order to obtain accurate dairy information from primary milk producers, all producers on the study are required to complete a detailed questionnaire of their dairy production activities each month. This questionnaire is shown in Appendix D of this report.

Research assistants collect the data, monitor the monthly collection and audit the data. This procedure ensures promptness in data collection and a minimum of recording error. The information is then entered into the computer. The computer output shown in Appendix A, B and C serves as supporting data for the report.

The analysis is based on data from fluid milk producers. Consequently the results indicate the cost level of producing fluid milk rather than industrial. The cost level for industrial milk might differ from fluid, but the difference is not substantial.

Sixty-one dairy producers across the province submitted business information for the calendar year 1988. Two regions are recognized for the purpose of analysis. The region lying north of 39th township is called Northern Alberta and is represented by 35 producers; the region south of the 39th township is referred to as Southern Alberta and is represented by 26 producers. The producers submitted business accounts throughout the year.

Sample

While the number of participants can change because of unforseen circumstances, the sample size is determined statistically every year. It was established that the variance of cost of producing milk in the population of fluid milk shippers was $3.75/hL. The desired variation was assumed to be 20 cents. The sample size was then determined by the formula.[1]

---

1 $$n = \frac{4 \times s^2}{L^2} \div \left(1 + \frac{n}{N}\right)$$

Where: n is sample size
N is population size
s is standard deviation of population
L is expected accuracy of sample.

The study was designed to represent a cross-section of the producers by the milk quota size. The provincial fluid milk shippers were arranged according to the quota size from largest to smallest in each of the two regions, Southern Alberta and Northern Alberta. The sample was selected by systematic sampling to provide better representation of the population. The average quota and herd size of the sample was 766 litres and 62 cows respectively. The sample size of 70 producers was determined to be statistically sufficient to represent the total population of fluid milk shippers. Out of that group 61 producers completed reports for the 12-month period needed for the study. Some characteristics of the sample are shown in the following table.

TABLE 2 1988 SAMPLE CHARACTERISTICS

Years in Dairy	Total Sample	Indebtedness (30%)		Farm Size (40)	
		Less Than	More Than	Less Than	More Than
	- - - - - - - - - percent of the sample - - - - - - - - -				
Total Sample (%)	100	46	54	20	80
Less than 10	39	6	33	5	34
More than 10	61	40	21	15	46

Production Conditions[2]

The season began with low levels of both surface and subsurface moisture reported in most districts. The dry surface conditions delayed seeding and caused serious wind erosion in areas. Seeding progressed slowly as farmers held back in anticipation of rain. Low slough and dugout levels caused shortages of water for livestock and surplus hay supplies disappeared as lack of pastures forced cattle producers to purchase feed. The dry conditions led to poor pasture conditions throughout much of the province. Despite this, livestock remained in good condition throughout the season. Rain in June was sufficient to improve moisture conditions in northern and

2 As reported by Statistics Branch of Alberta Agriculture.

central regions, but insufficient for improvement in southern and eastern Regions. This continued to be the pattern throughout the season.

While the area seeded to grains dropped in 1988, the area in hay production increased by 6 per cent, to 4,650,000 acres. Summerfallow increased by 2 per cent, to 5,400 acres.

A surplus of hay in early April was quickly depleted and shortages began to arise within one month as producers purchased feed to finish wintering stock. In the north east region, cattle were sent out to pastures prematurely despite concerns of water shortages. As rain patterns developed, pastures in the north improved, but southern pastures remained poor. Some supplemented feeding of cattle began in late September in the south. Despite poor pasture conditions and low water supplies, cattle and sheep remain in good condition.

In general, feed grains were of good to excellent quality. Only a small pocket near High River and Stavely produced poor quality feed grains. Fair quality feed grains could be found in localized areas of the province: Hanna, Acadia Valley and Veteran in the east, Valleyview and Falher in the north.

Less than one percent of feed and straw supplies were rated as poor quality. The majority of hay was of good to excellent quality with the exception of south western Alberta and central regions near the Saskatchewan border.

IV. ANALYSIS OF RESULTS

Income

The program of supply management of fluid milk in Alberta is administered by the Alberta Dairy Control Board. Fluid milk quotas held by the producers are assigned by the Board to the processing plants. The minimum fluid milk prices at farm, wholesale and retail levels are established by an independent Public Utilities Board (PUB). The PUB uses a fluid milk price formula[3] to establish the monthly farm price. The producer price changed three times in 1988, in June, August and October. The chronology of the price changes are shown in Table 3.

TABLE 3 FLUID MILK PRICE CHANGES IN 1988

Effective Date	Producer Price $/hL	Wholesale Price ¢/L	Retail Price ¢/L
December 31, 1987	48.13	79	85
January 1, 1988	48.13	80	86
March 1, 1988	48.13	81	88
June 1, 1988	49.11	82	89
August 1, 1988	50.09	83	90
October 1, 1988	51.07	84	91
Average	49.36	82.08	88.92

Fluid milk sales increased by one per cent over the previous year to 260.2 million litres from 258.6 million litres in 1987.

The utilization of assigned fluid milk quota in 1988 was 74.8 percent compared to 75.4 percent in 1987, slightly lower.

---

3 The Alberta milk price formula was first adopted in November 1974; there was a major revision on July 1, 1980. A concise description of the formula is given in Appendix E.

Fluid milk producers shipping milk in excess of designated Class 1 (fluid) milk received a $6.04 per hectolitre (hL) subsidy if the milk was covered by national market share quota. The subsidy was paid in addition to industrial milk prices. Of this subsidy, the Canadian Dairy Commission (CDC) held back a levy of $4.02 per hectolitre to pay the support program expenses. In addition to the levy, the CDC continued to impose a 30 cent skim-off levy on fluid milk deliveries.

The over-quota levies collected during the year are usually refunded depending on the provincial quota situation on July 31 (dairy year end). In 1988 the Alberta total deliveries exceeded the MSQ by 1.3 percent, therefore, as in 1987, there was only a partial refund to the producers.

The diagram on the following page summarizes the quantity, price and utilization of milk in Alberta.

Table 5 portrays the cost of producing milk for the dairy enterprise in Alberta; for comparison Tables 6 and 7 display the results of Northern and Southern regions, respectively. Gross income is the sum of milk sales and value for inventory adjustment. During the 1988 production year, the price of fluid milk has increased gradually from $48.13 to $51.07 per hectolitre at the conclusion of the year. This resulted in a higher blend price of all classes of milk in 1988. The fluid blend price of $46.96 per hectolitre of milk sold was $2.06 higher than the 1987 price. The fluid milk utilization of assigned fluid quota did not play a significant role in the milk price in 1988. Another positive effect on producers income was felt by the reduction in the levies paid by the producers, i.e. in-quota levy as well as over-quota levy. The composite levy per hectolitre of all milk dropped from $2.61 to $1.85. The miscellaneous receipts remained unchanged at $0.28 per hectolitre.

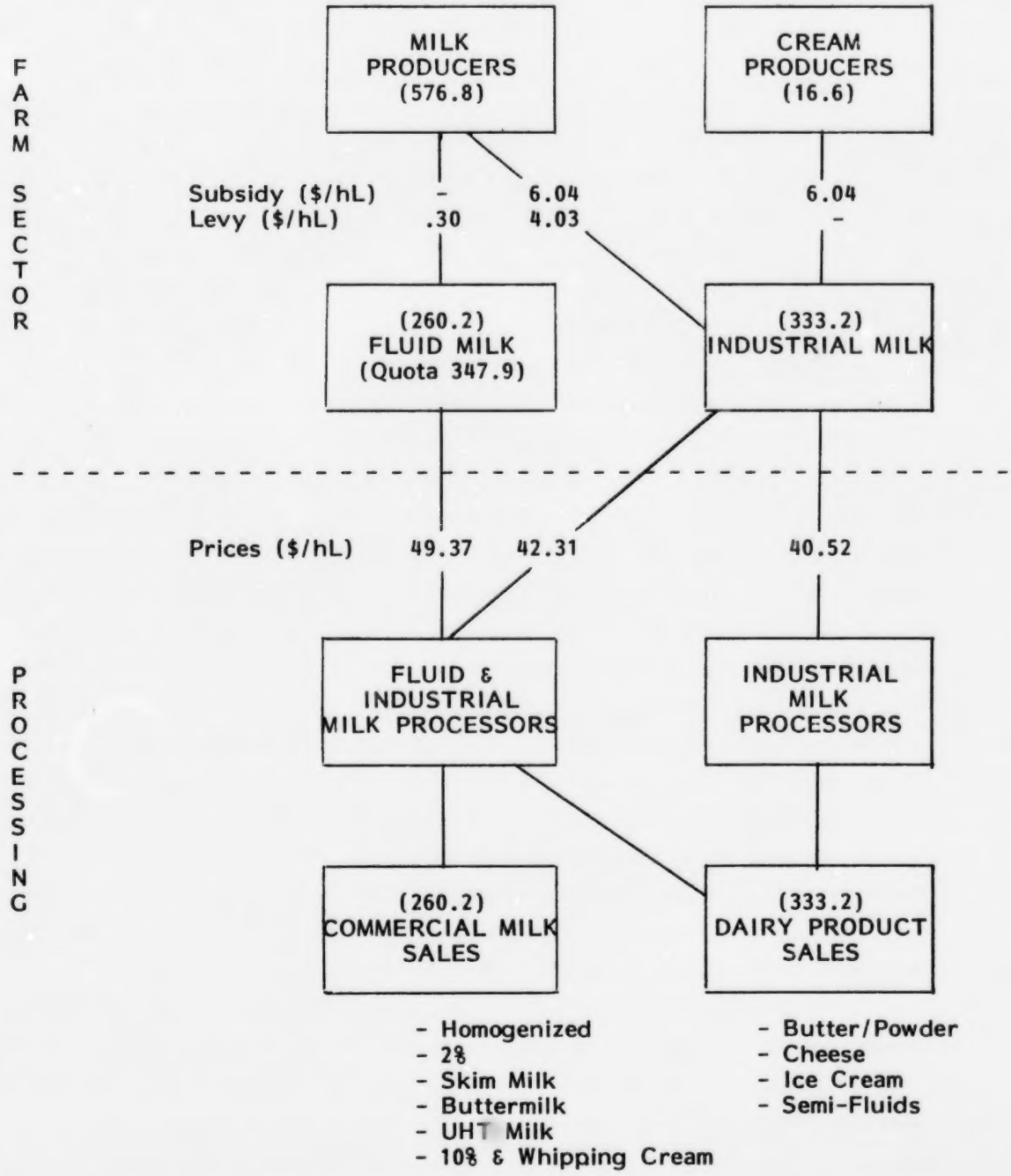
Due to an increase in cow productivity in 1988 compared to 1987, there were gains in income per cow relative to gains on a per hectolitre basis. Income per cow increased by 7.1 per cent, while the income per hectolitre increased by 4.75 per cent.

Inventory adjustment or the value for herd growth and credits increased in 1988 by $33.01 per cow to $287.67 or 4.39 per hectolitre.

The gross income per hectolitre of milk sold averaged $51.08, up 4.8 per cent from $48.76 in 1987.

DIAGRAM 2

- 1988 milk in million litres
- Prices are 1988 averages



Production Costs

Table 4 shows the average values of the three most significant inputs; capital, labour and feed.

Investment value per cow increased in the 1988 sample by 7.6 per cent over the previous year, while indebtedness increased only marginally from 35 per cent to 36 per cent. Feed prices showed a significant increase in 1988. The concentrate blend price jumped by 28.0 per cent from the 1987 price. In addition to the rise in grain prices, the $13.00 feed grain market adjustment program was still in effect. The increase in roughage prices was less significant in 1988, the average value for roughage increased by 5.3 per cent in 1988. The hourly rate paid for hired labour remained almost unchanged for the 1988 sample at $8.06 per hour.

TABLE 4: INPUT PRICES

	1987		1988	
	% Use	Average Price	% Use	Average Price
		$/cow		$/cow
Depreciable Investment		2887		3253
Livestock Investment		2114		2101
Total Investment	35*	5347	36*	5753
		$/tonne		$/tonne
Grain & Concentrate -homegrown	33	45.1	29	74.5
-purchased	67	156.8	71	185.9
Roughage -homegrown	81	58.6	87	63.5
-purchased	19	77.1	13	78.2
		$/hr		$/hr
Labour -hired	29	8.19	29	8.06
-family	71	7.52	71	7.76

*Debt/capital ratio or per cent indebtedness.

The above input prices, together with the input volume used on the farm made up the cost structure. The total production cost per hectolitre of milk increased by $2.40 in 1988, from $39.77 to $42.17. While the dairy cash expenses, such as fuel, utilities, medicine, etc. remained quite stable at $10.97 per hectolitre, the feed cost registered the highest increase of 15.2

per cent from $12.46 per hL to $14.35. The feed cost in 1988 accounted for 28.1 per cent of income, up from 25.5 per cent a year ago.

The labour cost in 1988, at $9.36 per hectolitre, accounted for 18.3 per cent of income, down from 20.0 per cent in 1987. Both wage rate and labour use remained almost unchanged in 1988. The same applies for indebtedness of 36 per cent in the 1988 sample, compared to 35 per cent in 1987.

The total production cost was $42.17 per hectolitre, an increase over $39.77 in 1987.

ALBERTA

TABLE 5 ***** DAIRY ENTERPRISE COSTS AND RETURNS *****

	PER HL. SOLD	PERCENT FROM INCOME	PER HL. SOLD	PERCENT FROM INCOME
INCOME:	1987		1988	
MILK SALES	44.90		45.98	
MILK SUBSIDY	2.48		2.56	
MILK LEVIES (-)	-2.61		-1.85	
MISCELLANEOUS RECEIPTS	0.28		0.28	
NET CATTLE SALES (+-)	3.19		3.42	
NET INVENTORY INCREASE (+-)	0.52		0.68	
GROSS INCOME	48.76	100.00	51.08	100.00
EXPENSES:				
GRAIN	1.32		1.79	
COMPLETE FEED	3.91		4.98	
SUPPLEMENT	1.17		1.17	
MINERALS & VITAMINS	0.27		0.36	
ROUGHAGE	5.70		5.99	
PROCESSING COSTS	0.09		0.06	
TOTAL FEED COSTS	12.46	25.55	14.35	28.10
BEDDING AND SUPPLIES	1.24		1.29	
VET. AND MEDICINE	1.27		1.37	
MILK HAULING	1.68		1.67	
PRODUCER'S FEES	0.75		0.79	
UTILITIES	1.08		1.12	
FUEL, OIL, LUBE	0.54		0.57	
BLDG. & MACH. REPAIRS	1.79		1.94	
TAXES AND INSURANCE	0.64		0.71	
MISCELLANEOUS	1.57		1.51	
TOTAL OTHER COSTS	10.56	21.65	10.97	21.47
HIRED LABOR	3.03		2.79	
FAMILY LABOR	6.73		6.57	
TOTAL LABOR COSTS	9.76	20.01	9.36	18.32
TOTAL OPERATING COSTS	32.78		34.67	
RENT	0.46		0.42	
DEPRECIATION	3.80		4.06	
INTEREST (CAP.DEBT)	2.74		3.02	
TOTAL CAPITAL COSTS	7.00	14.35	7.50	14.69
TOTAL PRODUCTION COST	39.77	81.56	42.17	82.57
RETURN TO CAPITAL	15.99		16.41	
RETURN TO EQUITY	8.99	18.44	8.90	17.43
MILK PRICE	44.77		46.69	
INVENTORY ADJUSTMENT	3.99		4.39	
INTEREST ON EQUITY (%)	16.47		15.85	
INTEREST ON DEBT (%)	9.39		9.58	

NORTHERN ALBERTA

TABLE 6 ***** DAIRY ENTERPRISE COSTS AND RETURNS *****

	PER HL. SOLD	PERCENT FROM INCOME	PER HL. SOLD	PERCENT FROM INCOME
	1987		1988	
INCOME:				
MILK SALES	44.94		45.89	
MILK SUBSIDY	2.58		2.68	
MILK LEVIES (-)	-2.68		-1.80	
MISCELLANEOUS RECEIPTS	0.27		0.39	
NET CATTLE SALES (+-)	2.71		3.59	
NET INVENTORY INCREASE (+-)	0.97		0.60	
GROSS INCOME	48.80	100.00	51.36	100.00
EXPENSES:				
GRAIN	1.35		2.01	
COMPLETE FEED	3.01		4.06	
SUPPLEMENT	1.62		1.63	
MINERALS & VITAMINS	0.30		0.45	
ROUGHAGE	5.69		5.86	
PROCESSING COSTS	0.14		0.08	
TOTAL FEED COSTS	12.11	24.82	14.09	27.42
BEDDING AND SUPPLIES	1.19		1.39	
VET. AND MEDICINE	1.32		1.35	
MILK HAULING	1.60		1.60	
PRODUCER'S FEES	0.87		0.88	
UTILITIES	1.05		1.11	
FUEL, OIL, LUBE	0.55		0.58	
BLDG. & MACH. REPAIRS	1.92		1.90	
TAXES AND INSURANCE	0.65		0.68	
MISCELLANEOUS	1.58		1.51	
TOTAL OTHER COSTS	10.73	21.99	10.99	21.40
HIRED LABOR	3.04		2.48	
FAMILY LABOR	7.25		7.62	
TOTAL LABOR COSTS	10.29	21.08	10.09	19.65
TOTAL OPERATING COSTS	33.13		35.17	
RENT	0.45		0.57	
DEPRECIATION	3.85		4.18	
INTEREST (CAP.DEBT)	2.94		3.86	
TOTAL CAPITAL COSTS	7.24	14.84	8.60	16.75
TOTAL PRODUCTION COST	40.37	82.73	43.77	85.23
RETURN TO CAPITAL	15.67		16.19	
RETURN TO EQUITY	8.43	17.27	7.58	14.77
MILK PRICE	44.85		46.77	
INVENTORY ADJUSTMENT	3.95		4.59	
INTEREST ON EQUITY (%)	15.95		14.23	
INTEREST ON DEBT (%)	9.52		9.89	

SOUTHERN ALBERTA

TABLE 7 ***** DAIRY ENTERPRISE COSTS AND RETURNS *****

	PER HL. SOLD	PERCENT FROM INCOME	PER HL. SOLD	PERCENT FROM INCOME
	1987		1988	
INCOME:				
MILK SALES	44.86		46.09	
MILK SUBSIDY	2.38		2.41	
MILK LEVIES (-)	-2.54		-1.91	
MISCELLANEOUS RECEIPTS	0.29		0.15	
NET CATTLE SALES (+-)	3.71		3.20	
NET INVENTORY INCREASE (+-)	0.03		0.80	
GROSS INCOME	48.72	100.00	50.74	100.00
EXPENSES:				
GRAIN	1.29		1.52	
COMPLETE FEED	4.87		6.11	
SUPPLEMENT	0.68		0.61	
MINERALS & VITAMINS	0.24		0.25	
ROUGHAGE	5.71		6.15	
PROCESSING COSTS	0.04		0.03	
TOTAL FEED COSTS	12.84	26.35	14.68	28.93
BEDDING AND SUPPLIES	1.29		1.16	
VET. AND MEDICINE	1.21		1.39	
MILK HAULING	1.77		1.76	
PRODUCER'S FEES	0.63		0.68	
UTILITIES	1.11		1.13	
FUEL, OIL, LUBE	0.52		0.56	
BLDG. & MACH. REPAIRS	1.65		1.99	
TAXES AND INSURANCE	0.62		0.74	
MISCELLANEOUS	1.55		1.52	
TOTAL OTHER COSTS	10.37	21.28	10.94	21.55
HIRED LABOR	3.01		3.17	
FAMILY LABOR	6.18		5.28	
TOTAL LABOR COSTS	9.19	18.86	8.45	16.64
TOTAL OPERATING COSTS	32.39		34.06	
RENT	0.46		0.24	
DEPRECIATION	3.75		3.91	
INTEREST (CAP.DEBT)	2.52		1.99	
TOTAL CAPITAL COSTS	6.73	13.81	6.14	12.10
TOTAL PRODUCTION COST	39.12	80.30	40.20	79.22
RETURN TO CAPITAL	16.33		16.68	
RETURN TO EQUITY	9.60	19.70	10.54	20.78
MILK PRICE	44.69		46.60	
INVENTORY ADJUSTMENT	4.02		4.15	
INTEREST ON EQUITY (%)	16.98		17.64	
INTEREST ON DEBT (%)	9.23		8.90	

Returns

Although income increased in 1988 due to milk price increases, the cost has increased as well, leaving the per cent return to equity almost unchanged at 15.8 per cent. The nominal value of the return declined only slightly from $8.99 per hectolitre to $8.90. Considering that bank investment certificate rates or government bond rates, have increased in 1988, the return on dairy farms was relatively lower.

One should keep in mind that the analysis does not include the value of the milk quota. This is a serious dilemma for new entrants. When actual payment for milk quota has been made, the return is then diluted to 5.8 per cent.

TABLE 8 RETURN TO EQUITY

	1988 Study	Including Quota Value
1. Dairy Investment ($)	356,881	674,792
2. Debt ($)	128,277	242,925
3. Equity ($)	228,604	431,867
4. Equity ($/hL)	56.24	106.25
5. Blend Price	46.69	46.69
6. Other Credits	4.39	4.39
7. Production Costs	42.17	44.88
8. Paid Interest	3.02	5.73
9. Return to Equity ($)	8.90	6.20
10. % Return (9 ÷ 4)	15.80	5.80

Table 9 illustrates the acceptable total debt load per cow at various levels of milk production and interest rates. The basic repayment capacity is given by gross return, i.e. money available for resource ownership payment, consisting of rent, depreciation, paid and equity interest ($1,047 per cow). This table should be used as a guideline only, each individual situation is different.

TABLE 9 ACCEPTABLE TOTAL DEBT LOAD PER COW

Milk Production	Interest Rate*					
	10 %	11 %	12 %	13 %	14 %	15 %
4,500 (hL/cow)	5700	5514	5176	4868	4590	4338
5,500	7211	6745	6327	5950	5610	5302
6,000	7867	7358	6902	6491	6120	5784
6,500	8522	7971	7477	7032	6630	6266
7,000	9178	8584	8052	7573	7140	6748

* At 20 Years Repayment Period.

Price Formula Comparison With Cost Study Results

Table 10 compares the 1988 cost study with the results of the formula price. Over the years the composite index of the formula was responsible for an increase of 134.6 per cent in the Class 1 price, which in turn contributed to the increase in the effective blend price received by the producers. The supply factors of the formula increased for the same period by 143 per cent, while the estimated cost of production increased by 142.5 per cent.

The results indicate that the formula, with minor discrepancies, performed quite well, and has been consistent with the study results. The return to equity per hectolitre increased over the 1973 base by 78.4 per cent, and the asset value increased by 67.5 per cent for the period, leaving 15.8 per cent return to equity compared to 15 per cent in 1973.

Inflation plays an important role in comparing returns for different periods. If the nominal return is discounted by the inflation rate, the resultant "real return" is more meaningful for comparison.

Two factors in respect to the comparison between cost study and the formula should be mentioned. Namely, the technology change reflected in increases in milk production over the years contributed 4.2 points in the 15.8 return. From Table 10, the equity per farm increased by 152.6 per cent over the 1973 base, however the same equity value per hectolitre increased by only 67.5 per cent because of the improvements in productivity. Secondly, the short term government assistance may have contributed to the changes in farm return. The continuation of these programs is unknown.

By and large, the formula adequately responded to the steady increase in cost of production in 1988, triggering the Class 1 milk price upward three times.

TABLE 10 COMPARISON OF 1988 DAIRY STUDY RESULTS WITH MILK PRICE FORMULA

	1973 Base	1988 Study	% Change
1. Dairy Investment ($)	90,513	356,881	294.3
2. Debt ($)	N/A	128,277	N/A
3. Equity (4)	90,513	228,604	152.6
4. Equity ($/hL)	33.58	56.24	67.5
5. Blend Price	19.36	46.69	141.2
6. Other Credits	3.02	4.39	45.4
7. Production Costs	17.39	42.17	142.5
8. Paid Interest	N/A	3.02	N/A
9. Return to Equity	4.99	8.90	78.4
10. % Return (9 ÷ 4)	15	15.8	-
11. Class 1 Price	21.04	49.37	134.6
12. Price Formula Indices	100.00	235.0	135.0
13. Price Formula Supply Indices	100.00	243.0	143.0

Management Profile

Dairy management is concerned with the organizing, planning, directing and supervising of a dairy business. Dairy farmers carry out these functions. In addition, many farmers provide their own labour.

Table 11 provides a cross-section of values of management factors. Estimates for the top 1/3 are given on the first line and the estimates for the bottom 1/3 group are on the second line. For instance, the top 1/3 group in milk production (7884L) spent $1,081 per cow on feed, while the bottom 1/3 group spent only $763.10 per cow. Labour use for the two groups was 76 hours per cow and 68 hours, respectively, and cost of producing a hectolitre was $44.01 and $41.19, respectively.

The overall level of management was determined by five factors:

1. Milk production per cow.
2. Total cost per hectolitre of milk.
3. Milk production for hours of work.
4. Feed conversion.
5. Milk production for dollar of investment.

Top 1/3 producers in all five factors were rated 3 and bottom 1/3 were rated 1. The last column in Table 11 indicates a blend of 1 and 3 for each factor, depending on whether that group had more top managers (closer to 3) or not.

Several conclusions can be derived from Table 11. Producers who are relatively new in dairy (6.7 years) have debt/capital ratio of 0.45, while for most established producers (26.7 years) indebtedness was reduced to 12%. The cost and milk production for the top 1/3 management group were 11.1 and 10.6 per cent, respectively, better than the provincial average.

TABLE 11

PROFILE OF MANAGEMENT FACTORS FOR TOP 1/3 AND BOTTOM 1/3 OF PRODUCERS

TOP 1/3 BOTTOM 1/3 AVERAGES FOR:	MILK PRODUC L/COW	TOTAL COST $/hL	YEARS IN DAIRY	HERD SIZE	INVES PER COW	DEBT/ CAPITAL RATIO	EQUITY RETURN %	FEED COST $/COW	LABOUR HR/COW	OVERALL MGMT RATING
MILK PRODUCTION L/COW	7884 5305	41.01 41.19	14.6 18.2	82.3 64.4	6228 4591	0.38 0.24	22.7 17.8	1080.9 763.1	76 68	2.5 1.6
TOTAL COST $/hL	6853 6445	35.31 49.79	18.0 16.0	82.4 79.1	4963 6603	0.26 0.36	30.7 3.7	873.4 986.0	64 91	2.5 1.3
YEARS IN DAIRY	6567 6989	41.47 41.07	26.7 6.7	73.3 69.8	5770 5406	0.12 0.45	13.8 28.7	909.0 953.7	75 79	2.0 2.1
HERD SIZE	6786 6819	40.76 43.47	16.1 15.4	103.9 37.9	5611 6148	0.34 0.34	21.7 13.0	911.1 932.6	71 88	2.0 1.8
INVESTMENT PER COW	7490 6097	46.98 38.94	15.1 18.0	79.0 77.1	7816 4124	0.36 0.25	6.9 25.8	1038.7 865.5	92 67	1.8 2.2
DEBT/CAPITAL RATIO	6506 7190	40.79 45.85	25.7 10.9	71.5 87.0	5244 6565	0.08 0.58	14.4 19.7	890.5 986.3	75 90	2.1 1.7
EQUITY RETURN %	7177 6687	37.25 49.16	15.8 16.9	84.1 80.0	4965 7052	0.38 0.33	35.8 2.7	954.7 970.8	71 90	2.6 1.4
FEED COST $/COW	5738 7726	39.75 42.42	15.1 12.2	62.8 70.3	5233 6006	0.32 0.39	22.4 19.0	668.4 1190.7	73 79	1.8 2.3
LABOUR HR/COW	6576 7255	39.70 47.38	15.3 13.9	84.8 79.8	5047 6835	0.32 0.39	23.6 9.1	971.2 1000.2	54 106	2.3 1.6
OVERALL MANAGEMENT RATING	7525 6025	37.50 47.50	15.9 14.4	80.9 83.0	5218 6436	0.32 0.41	30.3 9.6	1008.8 865.9	66 87	3.0 1.0

Each factor's top 1/3 and bottom 1/3 values are listed in the diagonal.
The remainder values in the line are cross-section values for the same groups.

Overall management is rated 3 for the high group and 1 for the low group.

APPENDIX A

ALBERTA

AVERAGE FARM SUMMARIES

ALBERTA (61)

TABLE 1 ***** DAIRY ENTERPRISE COSTS AND RETURNS *****
1988

	TOTAL ENTERPRISE	PER COW	PER HL. SOLD	PERCENT FROM INCOME
INCOME:				
MILK SALES	187050.23	3015.21	45.98	
MILK SUBSIDY	10421.61	167.99	2.56	
MILK LEVIES (-)	-7513.89	-121.12	-1.85	
MISCELLANEOUS RECEIPTS	1154.54	18.61	0.28	
NET CATTLE SALES (+-)	13905.26	224.15	3.42	
NET INVENTORY INCREASE (+-)	2786.03	44.91	0.68	
GROSS INCOME	207803.78	3349.75	51.08	100.00
EXPENSES:				
GRAIN	7284.75	117.43	1.79	
COMPLETE FEED	20246.63	326.37	4.98	
SUPPLEMENT	4779.15	77.04	1.17	
MINERALS & VITAMINS	1466.15	23.63	0.36	
ROUGHAGE	24378.66	392.98	5.99	
PROCESSING COSTS	227.89	3.67	0.06	
TOTAL FEED COSTS	58383.22	941.13	14.35	28.10
BEDDING AND SUPPLIES	5240.51	84.48	1.29	
VET. AND MEDICINE	5560.23	89.63	1.37	
MILK HAULING	6796.33	109.56	1.67	
PRODUCER'S FEES	3219.82	51.90	0.79	
UTILITIES	4550.49	73.35	1.12	
FUEL, OIL, LUBE	2318.16	37.37	0.57	
BLDG. & MACH. REPAIRS	7877.81	126.99	1.94	
TAXES AND INSURANCE	2889.25	46.57	0.71	
MISCELLANEOUS	6159.52	99.29	1.51	
TOTAL OTHER COSTS	44612.12	719.14	10.97	21.47
HIRED LABOR	11335.00	182.72	2.79	
FAMILY LABOR	26729.16	430.87	6.57	
TOTAL LABOR COSTS	38064.16	613.59	9.36	18.32
TOTAL OPERATING COSTS	141059.50	2273.85	34.67	
RENT	1708.30	27.54	0.42	
DEPRECIATION	16522.44	266.34	4.06	
INTEREST (CAP.DEBT)	12286.95	198.06	3.02	
TOTAL CAPITAL COSTS	30517.70	491.94	7.50	14.69
TOTAL PRODUCTION COST	171577.20	2765.79	42.17	82.57
RETURN TO CAPITAL	66744.28	1075.90	16.41	
RETURN TO EQUITY	36226.59	583.97	8.90	17.43
MILK PRICE			46.69	
INVENTORY ADJUSTMENT			4.39	
INTEREST ON EQUITY (%)			15.85	
INTEREST ON DEBT (%)			9.58	

ALBERTA (61)

TABLE 2 ***** STATEMENT OF INVESTMENT *****
1988

LAND BUILDINGS & EQUIPMENT	AGE	DEPRECIATION	DAIRY INVESTMENT
DAIRY BUILDINGS	8.99	6146.29	144135.75
POWER MACHINERY	4.86	3960.25	26987.91
DAIRY EQUIPMENT	6.82	5572.87	26460.11
OTHER EQUIPMENT	5.59	843.04	4209.49
TOTAL EQUIPMENT	5.61	10376.16	57657.51
LAND			19665.36
SUPPLIES			5072.43
** SUBTOTAL **		16522.44	226531.06

DAIRY LIVESTOCK	--BEGIN YEAR---- NUMBER	VALUE	--END OF YEAR--- NUMBER	VALUE	AVERAGE VALUE
COWS	62.05	97044.92	62.98	98506.36	97775.64
BRED HEIFERS	17.44	16570.49	17.61	16726.23	16648.36
OPEN HEIFERS	18.59	9295.08	19.25	9622.95	9459.02
HEIFER CALVES	23.02	4603.28	25.05	5009.84	4806.56
BULL CALVES	7.30	911.89	10.77	1346.31	1129.10
BULLS	0.44	531.15	0.44	531.15	531.15
** SUBTOTAL **	128.84	128956.80	136.10	131742.84	130349.82

TOTAL DAIRY INVESTMENT	356880.88
CAPITAL LOANS	128276.75
OPERATOR EQUITY	228604.13
INVESTMENT PER COW	5752.85
DEBT/CAPITAL RATIO	0.36
CAPITAL TURNOVER (YR)	1.72

------HERD SIZE------

NUMBER OF DAIRY COWS	62.04
NUMBER OF ANIMAL UNITS	99.93
DRY COWS (%)	16.80
CALF CROP (%)	93.65
PASTURE PER COW (AC.)	0.91

-----CATTLE SALES & PURCHASES-----

	NUMBER	SELLING PRICE	NUMBER	PURCHASE PRICE
COWS	17.69	710.44	3.41	1256.62
BRED HEIFERS	1.89	1113.16	1.52	1116.45
OPEN HEIFERS	2.34	647.45	0.74	626.67
HEIFER CALVES	1.61	224.70	0.26	409.06
BULL CALVES	20.31	181.60	0.03	250.00
BULLS	0.44	1081.63	0.15	1544.44
TOTAL VALUE		20697.93		6792.67

ALBERTA (61)

TABLE 3 ***** LABOUR AND MANAGEMENT *****
1988

LABOUR	HOURS	VALUE	HOURLY RATE
OPERATOR LABOR	2404.86	21042.50	8.75
HIRED LABOR	1407.05	11335.00	8.06
FAMILY UNPAID LABOR	1041.02	5686.66	5.46
TOTAL	4852.93	38064.16	7.84

RETURN TO FAMILY LABOR	10.97	$/HR.
MAN EQUIVALENTS	1.94	
LABOR HOURS PER COW	78.23	
YEARS FARMING	15.25	

MILK PRODUCTION	HL.	% OF TOTAL	VALUE	PRICE
QUOTA MILK	2938.46	69.61	140275.51	47.74
OVER QUOTA MILK	1105.48	26.19	45640.66	41.29
OTHER MILK SALES	20.86	0.49	967.60	46.38
FED TO LIVESTOCK	156.61	3.71	7200.15	45.98
TOTAL	4221.42	100.00	194083.91	45.98

FLUID QUOTA	765.82	LITRES/DAY
QUOTA PRICE	256.29	$/LITRE
CLASS 1 UTILIZATION	74.79	%
BUTTERFAT TEST	3.71	KG/HL
MILK PRODUCTION PER COW	6804.84	LITRES

MANAGEMENT FACTORS

COST PER HL	42.17	
MILK/FEED (KG) RATIO	1.93	LITRES
MILK/LABOUR (HR) RATIO	86.99	LITRES
MILK/CAPITAL ($) RATIO	1.18	LITRES

ALBERTA (61)

TABLE 4

***** FEED REPORT *****
1988

	----PURCHASED-----		----HOMEGROWN-----	
CONCENTRATES	QUANTITY (TONNES)	PRICE	QUANTITY (TONNES)	PRICE
OATS	2.42	97.57	8.45	104.25
BARLEY	18.77	69.31	42.73	66.60
WHEAT			0.18	94.58
MIXED GRAIN	2.07	104.27	11.44	81.75
BREW GRAIN (DRY EQ.)	4.59	140.72		
BEET PULP	0.69	137.68		
DAIRY RATION	107.61	178.21		
CALF FEED	3.00	356.21		
SUPPLEMENT	14.20	336.53		
MOLASSES	0.47	241.77		
SALT	0.59	285.69		
MINERALS & VITAMINS	2.08	623.38		
SUBTOTAL ----------	156.49	29098.29	62.79	4678.39
ROUGHAGE				
ALFALFA HAY	41.95	80.22	173.95	66.82
ALFALFA PELLETS	1.18	123.12		
STRAW FED	0.96	27.73	0.94	28.20
GREENFEED	1.38	43.85	10.08	45.56
SILAGE (DRY EQ.)	2.77	63.74	139.63	60.84
SUBTOTAL ----------	48.24	3774.23	324.60	20604.43
GRINDING		227.89		
GRAND TOTAL FEED COSTS ----------		33100.41		25282.82
BEDDING STRAW	14.75	26.05	29.32	27.83

AV.PRICE: CONCENTRATE	154.03	$/TONNE
ROUGHAGE	65.39	$/TONNE
FED PER COW: CONCENTRATE	3.53	TONNES
ROUGHAGE	6.01	TONNES
% HOME GROWN: CONCENTRATE	28.64	%
ROUGHAGE	87.06	%

APPENDIX B

NORTHERN ALBERTA

AVERAGE FARM SUMMARIES

NORTHERN ALBERTA (35)

TABLE 1 ***** DAIRY ENTERPRISE COSTS AND RETURNS *****
1988

	TOTAL ENTERPRISE	PER COW	PER HL. SOLD	PERCENT FROM INCOME
INCOME:				
MILK SALES	179724.73	2948.61	45.89	
MILK SUBSIDY	10501.43	172.29	2.68	
MILK LEVIES (-)	-7036.26	-115.44	-1.80	
MISCELLANEOUS RECEIPTS	1533.11	25.15	0.39	
NET CATTLE SALES (+-)	14075.10	230.92	3.59	
NET INVENTORY INCREASE (+-)	2360.64	38.73	0.60	
GROSS INCOME	201158.76	3300.26	51.36	100.00
EXPENSES:				
GRAIN	7864.92	129.03	2.01	
COMPLETE FEED	15886.13	260.63	4.06	
SUPPLEMENT	6400.09	105.00	1.63	
MINERALS & VITAMINS	1761.33	28.90	0.45	
ROUGHAGE	22957.78	376.65	5.86	
PROCESSING COSTS	297.20	4.88	0.08	
TOTAL FEED COSTS	55167.46	905.09	14.09	27.42
BEDDING AND SUPPLIES	5453.07	89.46	1.39	
VET. AND MEDICINE	5273.23	86.51	1.35	
MILK HAULING	6253.37	102.59	1.60	
PRODUCER'S FEES	3459.31	56.75	0.88	
UTILITIES	4340.49	71.21	1.11	
FUEL, OIL, LUBE	2257.40	37.04	0.58	
BLDG. & MACH. REPAIRS	7423.94	121.80	1.90	
TAXES AND INSURANCE	2679.31	43.96	0.68	
MISCELLANEOUS	5906.77	96.91	1.51	
TOTAL OTHER COSTS	43046.89	706.24	10.99	21.40
HIRED LABOR	9695.22	159.06	2.48	
FAMILY LABOR	29840.17	489.57	7.62	
TOTAL LABOR COSTS	39535.39	648.63	10.09	19.65
TOTAL OPERATING COSTS	137749.75	2259.96	35.17	
RENT	2221.23	36.44	0.57	
DEPRECIATION	16379.80	268.73	4.18	
INTEREST (CAP.DEBT)	15100.40	247.74	3.86	
TOTAL CAPITAL COSTS	33701.42	552.91	8.60	16.75
TOTAL PRODUCTION COST	171451.17	2812.87	43.77	85.23
RETURN TO CAPITAL	63409.02	1040.30	16.19	
RETURN TO EQUITY	29707.59	487.39	7.58	14.77
MILK PRICE			46.77	
INVENTORY ADJUSTMENT			4.59	
INTEREST ON EQUITY (%)			14.23	
INTEREST ON DEBT (%)			9.89	

NORTHERN ALBERTA (35)

TABLE 2 ***** STATEMENT OF INVESTMENT *****
1988

LAND BUILDINGS & EQUIPMENT	AGE	DEPRECIATION	DAIRY INVESTMENT
DAIRY BUILDINGS	8.18	6793.29	158717.31
POWER MACHINERY	4.61	3576.61	24462.47
DAIRY EQUIPMENT	6.63	5352.32	25622.20
OTHER EQUIPMENT	5.51	657.58	3292.81
TOTAL EQUIPMENT	5.40	9586.51	53377.47
LAND			17010.34
SUPPLIES			4653.76
** SUBTOTAL **		16379.80	233758.88

DAIRY LIVESTOCK	--BEGIN YEAR---- NUMBER	VALUE	--END OF YEAR--- NUMBER	VALUE	AVERAGE VALUE
COWS	61.40	95129.65	61.51	95306.72	95218.19
BRED HEIFERS	17.00	16150.00	17.54	16665.71	16407.86
OPEN HEIFERS	18.11	9057.14	18.69	9342.86	9200.00
HEIFER CALVES	22.91	4582.86	26.37	5274.29	4928.57
BULL CALVES	8.03	1003.57	12.46	1557.14	1280.36
BULLS	0.43	514.29	0.54	651.43	582.86
** SUBTOTAL **	127.89	126437.51	137.11	128798.15	127617.83

TOTAL DAIRY INVESTMENT	361376.71
CAPITAL LOANS	152656.62
OPERATOR EQUITY	208720.09
INVESTMENT PER COW	5928.84
DEBT/CAPITAL RATIO	0.42
CAPITAL TURNOVER (YR)	1.80

------HERD SIZE------

NUMBER OF DAIRY COWS	60.95
NUMBER OF ANIMAL UNITS	99.15
DRY COWS (%)	17.08
CALF CROP (%)	93.98
PASTURE PER COW (AC.)	0.83

-----CATTLE SALES & PURCHASES-----

	NUMBER	SELLING PRICE	NUMBER	PURCHASE PR
COWS	17.66	711.16	3.69	1271.5
BRED HEIFERS	2.66	1139.27	1.97	1070.29
OPEN HEIFERS	2.83	711.30	1.03	600.00
HEIFER CALVES	1.60	170.18	0.43	423.00
BULL CALVES	20.57	188.01	0.03	300.00
BULLS	0.23	1086.62	0.20	1528.57
TOTAL VALUE		21984.53		7909.43

TABLE 3 ***** LABOUR AND MANAGEMENT *****
1988

LABOUR	HOURS	VALUE	HOURLY RATE
OPERATOR LABOR	2625.24	22970.87	8.75
HIRED LABOR	1267.26	9695.22	7.65
FAMILY UNPAID LABOR	1240.64	6869.30	5.54
TOTAL	5133.14	39535.39	7.70

RETURN TO FAMILY LABOR	9.46	$/HR.
MAN EQUIVALENTS	2.05	
LABOR HOURS PER COW	84.22	
YEARS FARMING	12.17	

MILK PRODUCTION	HL.	% OF TOTAL	VALUE	PRICE
QUOTA MILK	2736.88	67.43	130924.86	47.84
OVER QUOTA MILK	1163.45	28.67	48022.54	41.28
OTHER MILK SALES	14.94	0.37	698.21	46.74
FED TO LIVESTOCK	143.37	3.53	6578.43	45.88
TOTAL	4058.64	100.00	186224.03	45.88

FLUID QUOTA	731.86	LITRES/DAY
QUOTA PRICE	242.36	$/LITRE
CLASS 1 UTILIZATION	74.79	%
BUTTERFAT TEST	3.72	KG/HL
MILK PRODUCTION PER COW	6658.71	LITRES

MANAGEMENT FACTORS

COST PER HL	43.77	
MILK/FEED (KG) RATIO	1.91	LITRES
MILK/LABOUR (HR) RATIO	79.07	LITRES
MILK/CAPITAL ($) RATIO	1.12	LITRES

NORTHERN ALBERTA (35)

TABLE 4

***** FEED REPORT *****
1988

	----PURCHASED-----		----HOMEGROWN-----	
CONCENTRATES	QUANTITY (TONNES)	PRICE	QUANTITY (TONNES)	PRICE
OATS	1.90	93.37	4.99	101.88
BARLEY	31.76	69.76	45.83	67.92
WHEAT			0.31	94.58
MIXED GRAIN	1.41	105.47	17.45	81.53
BREW GRAIN (DRY EQ.)	0.12	128.07		
BEET PULP	0.50	128.07		
DAIRY RATION	81.67	182.54		
CALF FEED	2.87	340.18		
SUPPLEMENT	19.37	330.41		
MOLASSES	0.73	234.09		
SALT	0.61	265.58		
MINERALS & VITAMINS	2.74	583.34		
SUBTOTAL ----------	143.69	26840.02	68.57	5072.45
ROUGHAGE				
ALFALFA HAY	30.02	72.47	197.28	66.69
ALFALFA PELLETS	2.06	123.07		
STRAW FED	0.16	33.00	1.06	27.91
GREENFEED	2.41	43.85	5.56	44.63
SILAGE (DRY EQ.)			117.22	59.57
SUBTOTAL ----------	34.65	2539.86	321.11	20417.93
GRINDING		297.20		
GRAND TOTAL FEED COSTS ----------		29677.08		25490.38
BEDDING STRAW	11.48	27.77	31.82	27.81

AV.PRICE: CONCENTRATE	150.34	$/TONNE
ROUGHAGE	64.53	$/TONNE
FED PER COW: CONCENTRATE	3.48	TONNES
ROUGHAGE	5.84	TONNES
% HOME GROWN: CONCENTRATE	32.31	%
ROUGHAGE	90.26	%

APPENDIX C

SOUTHERN ALBERTA

AVERAGE FARM SUMMARIES

SOUTHERN ALBERTA (26)

TABLE 1 ***** DAIRY ENTERPRISE COSTS AND RETURNS *****
1988

	TOTAL ENTERPRISE	PER COW	PER HL. SOLD	PERCENT FROM INCOME
INCOME:				
MILK SALES	196912.40	3101.30	46.09	
MILK SUBSIDY	10314.15	162.44	2.41	
MILK LEVIES (-)	-8156.85	-128.47	-1.91	
MISCELLANEOUS RECEIPTS	644.92	10.16	0.15	
NET CATTLE SALES (+-)	13676.62	215.40	3.20	
NET INVENTORY INCREASE (+-)	3396.64	53.50	0.80	
GROSS INCOME	216787.89	3414.33	50.74	100.00
EXPENSES:				
GRAIN	6503.74	102.43	1.52	
COMPLETE FEED	26116.54	411.33	6.11	
SUPPLEMENT	2597.11	40.90	0.61	
MINERALS & VITAMINS	1068.79	16.83	0.25	
ROUGHAGE	26291.38	414.08	6.15	
PROCESSING COSTS	134.58	2.12	0.03	
TOTAL FEED COSTS	62712.14	987.69	14.68	28.93
BEDDING AND SUPPLIES	4954.38	78.03	1.16	
VET. AND MEDICINE	5946.58	93.66	1.39	
MILK HAULING	7527.23	118.55	1.76	
PRODUCER'S FEES	2897.42	45.63	0.68	
UTILITIES	4833.19	76.12	1.13	
FUEL, OIL, LUBE	2399.96	37.80	0.56	
BLDG. & MACH. REPAIRS	8488.79	133.70	1.99	
TAXES AND INSURANCE	3171.05	49.96	0.74	
MISCELLANEOUS	6499.75	102.37	1.52	
TOTAL OTHER COSTS	46719.15	735.81	10.94	21.55
HIRED LABOR	13542.40	213.29	3.17	
FAMILY LABOR	22541.26	355.02	5.28	
TOTAL LABOR COSTS	36083.65	568.30	8.45	16.64
TOTAL OPERATING COSTS	145514.94	2291.81	34.06	
RENT	1017.82	16.03	0.24	
DEPRECIATION	16714.46	263.25	3.91	
INTEREST (CAP.DEBT)	8499.63	133.87	1.99	
TOTAL CAPITAL COSTS	26231.91	413.14	6.14	12.10
TOTAL PRODUCTION COST	171746.85	2704.95	40.20	79.22
RETURN TO CAPITAL	71272.95	1122.52	16.68	
RETURN TO EQUITY	45041.04	709.38	10.54	20.78
MILK PRICE			46.60	
INVENTORY ADJUSTMENT			4.15	
INTEREST ON EQUITY (%)			17.64	
INTEREST ON DEBT (%)			8.90	

SOUTHERN ALBERTA (26)

TABLE 2 ***** STATEMENT OF INVESTMENT *****
1988

LAND BUILDINGS & EQUIPMENT	AGE	DEPRECIATION	DAIRY INVESTMENT
DAIRY BUILDINGS	10.27	5275.32	124440.97
POWER MACHINERY	5.16	4476.68	30376.65
DAIRY EQUIPMENT	7.07	5869.76	27588.07
OTHER EQUIPMENT	5.63	1092.71	5445.80
TOTAL EQUIPMENT	5.85	11439.14	63410.52
LAND			23239.42
SUPPLIES			5636.04
** SUBTOTAL **		16714.46	216726.95

DAIRY LIVESTOCK	--BEGIN YEAR---- NUMBER	VALUE	--END OF YEAR--- NUMBER	VALUE	AVERAGE VALUE
COWS	62.92	99653.21	64.96	102881.59	101267.40
BRED HEIFERS	18.04	17136.54	17.69	16807.69	16972.12
OPEN HEIFERS	19.23	9615.38	20.00	10000.00	9807.69
HEIFER CALVES	23.15	4630.77	23.27	4653.85	4642.31
BULL CALVES	6.31	788.46	8.50	1062.50	925.48
BULLS	0.46	553.15	0.31	369.23	461.54
** SUBTOTAL **	130.12	132378.21	134.73	135774.86	134076.53
TOTAL DAIRY INVESTMENT					350803.49
CAPITAL LOANS					95457.69
OPERATOR EQUITY					255345.79
INVESTMENT PER COW					5525.02
DEBT/CAPITAL RATIO					0.27
CAPITAL TURNOVER (YR)					1.62

------HERD SIZE------

NUMBER OF DAIRY COWS	63.49
NUMBER OF ANIMAL UNITS	100.99
DRY COWS (%)	16.48
CALF CROP (%)	93.23
PASTURE PER COW (AC.)	1.01

-----CATTLE SALES & PURCHASES-----

	NUMBER	SELLING PRICE	NUMBER	PURCHASE PRICE
COWS	17.73	709.47	3.04	1232.19
BRED HEIFERS	0.85	1002.77	0.92	1249.17
OPEN HEIFERS	1.69	503.77	0.35	733.33
HEIFER CALVES	1.62	297.40	0.04	200.00
BULL CALVES	19.96	172.70	0.04	200.00
BULLS	0.73	1036.89	0.08	1600.00
TOTAL VALUE		18965.97		5289.35

SOUTHERN ALBERTA (26)

TABLE 3 ***** LABOUR AND MANAGEMENT *****
1988

LABOUR	HOURS	VALUE	HOURLY RATE
OPERATOR LABOR	2108.18	18446.62	8.75
HIRED LABOR	1595.23	13542.40	8.49
FAMILY UNPAID LABOR	772.31	4094.64	5.30
TOTAL	4475.72	36083.65	8.06

RETURN TO FAMILY LABOR	13.71	$/HR.
MAN EQUIVALENTS	1.79	
LABOR HOURS PER COW	70.49	
YEARS FARMING	19.38	

MILK PRODUCTION	HL.	% OF TOTAL	VALUE	PRICE
QUOTA MILK	3209.82	72.28	152862.92	47.62
OVER QUOTA MILK	1027.45	23.14	42434.27	41.30
OTHER MILK SALES	28.84	0.65	1331.18	46.16
FED TO LIVESTOCK	174.42	3.93	8039.20	46.09
TOTAL	4440.54	100.00	204667.57	46.09

FLUID QUOTA	811.54	LITRES/DAY
QUOTA PRICE	269.27	$/LITRE
CLASS 1 UTILIZATION	74.79	%
BUTTERFAT TEST	3.70	KG/HL
MILK PRODUCTION PER COW	6993.68	LITRES

MANAGEMENT FACTORS

COST PER HL	40.20	
MILK/FEED (KG) RATIO	1.94	LITRES
MILK/LABOUR (HR) RATIO	99.21	LITRES
MILK/CAPITAL ($) RATIO	1.27	LITRES

SOUTHERN ALBERTA (26)

TABLE 4

***** FEED REPORT *****
1988

	----PURCHASED-----		----HOMEGROWN-----	
CONCENTRATES	QUANTITY (TONNES)	PRICE	QUANTITY (TONNES)	PRICE
OATS	3.12	101.00	13.12	105.46
BARLEY	1.27	54.24	38.55	64.48
WHEAT				
MIXED GRAIN	2.95	103.50	3.35	83.30
BREW GRAIN (DRY EQ.)	10.61	140.92		
BEET PULP	0.95	144.47		
DAIRY RATION	142.53	174.86		
CALF FEED	3.17	375.75		
SUPPLEMENT	7.24	358.60		
MOLASSES	0.11	308.29		
SALT	0.56	315.02		
MINERALS & VITAMINS	1.19	747.26		
SUBTOTAL ----------	173.71	32138.26	55.01	4147.92
ROUGHAGE				
ALFALFA HAY	58.00	85.61	142.54	67.06
ALFALFA PELLETS	0.00	150.00		
STRAW FED	2.04	27.18	0.80	28.72
GREENFEED			16.17	45.99
SILAGE (DRY EQ.)	6.50	63.74	169.79	62.02
SUBTOTAL ----------	66.54	5435.90	329.30	20855.48
GRINDING		134.58		
GRAND TOTAL FEED COSTS ----------		37708.73		25003.41
BEDDING STRAW	19.16	24.67	25.96	27.87

AV.PRICE: CONCENTRATE	158.65	$/TONNE
ROUGHAGE	66.42	$/TONNE
FED PER COW: CONCENTRATE	3.60	TONNES
ROUGHAGE	6.23	TONNES
% HOME GROWN: CONCENTRATE	24.05	%
ROUGHAGE	83.19	%

APPENDIX D

MONTHLY QUESTIONNAIRE

Alberta
AGRICULTURE
Production Economics Branch
7000 - 113 Street
Edmonton, Alberta, T6H 5T6

DAIRY COST SURVEY

MONTH: _____

NAME: _____ YEAR: _____

DAIRY HERD:	Beginning No.	Purchases No.	Purchases Value	No. Born	No. Died	Sales No.	Sales Value	End No.
Cows Milking		02					04	
Cows Dry								
Bred Heifers								
Open Heifers								
Heifer Calves								05
Bull Calves			03					
Herd Bulls								

SALES:

	Specify	
Private Milk Sales	(Litres)	
	(Value)	
Milk fed to Livestock	(Liters)	
Milk Home Use	(Litres)	
Miscellaneous Income	(specify)	

CAPITAL PURCHASES:

		Total Value	% to Dairy
Equipment:	Purchases		
	Sales		
Tractor, Truck, Auto:	Purchases	06	
	Sales		
Buildings:	Purchases (or completed constr.)		
	Sales		07
Fluid Quota; Sold ☐ or Purchased ☐			Lit.

OFFICE USE		OFFICE USE	OFFICE USE
Quota Milk (L)	07	Freight	
(Value)		Fees	
Over Quota (L)		Butterfat Test	08
(Value)		Utilization	
Subsidy		Levy Refund	
Levies			

FEED:	Tonnes Fed	Price if Purchased	Office Use	FEED:	Tonnes Fed	Price
Barley				Dairy Ration		
Oats				Supplement		
Wheat				Calf Feed (kg)		
Mix Grain				Salt (kg)		
Hay				Min. & Vit (kg)		
Silage				Brew Grain		
Greenfeed	09			Beet Pulp		
Strawfeed		10	11	Molasses	12	
Bed. Straw				Alfalfa Pellets		13
				Grinding Charges		

LABOUR:	Dairy Chores Only	Hours	Wages & Board
Operator		13	
Unpaid Labour	1.		
	2.		
	3. (under 18)		
Hired Paid Labour	1.		
	2.		14
	3.		

EXPENSES:	Particulars	Total Farm ($)	Dairy Portion ($)
Vet. & Medicine			
Barn Supplies			
Building & Fence Repairs & Hardware			
Machinery & Equipment Repairs			
Fuel, Oil, Lube			
Utilities			
Insurance & Licences			
Property Taxes			
Cash Rental			15
Operating Loan Interest			
Other Expenses			

Alberta
AGRICULTURE
Production Economics Branch
7000 - 113 Street
Edmonton, alberta T6H 5T6

DAIRY COST SURVEY — INVESTMENT

Name: _____ Year: _____

LOANS	OWING JAN 1	INTEREST RATE	DAIRY %
LAND			29
BUILDINGS			
LIVESTOCK	26	28	
MACHINERY			

SUPPLIES	VALUE JAN 1		
GAS OIL GREASE			
POSTS AND WIRE			
SHAVINGS			30
DAIRY LIVESTOCK SUPPLIES			
RATIONS & SUPPLEMENTS			
OTHER SUPPLIES			

OFFICE USE ONLY

BEGINNING YEAR	NUMBER	PRICE	
COWS	27		
BRED HEIFERS			
OPEN HEIFERS			
HEIFER CALVES			
BULL CALVES			
BULLS			

BUILDINGS USED FOR DAIRY	PURCHASED PRICE	YEARS KEPT	DAIRY %
	16		
		20	
			24

TRACTORS & TRUCKS USED FOR DAIRY			
	17		
		21	

DAIRY EQUIPMENT			
	18		
		22	

OTHER EQUIPMENT USED FOR DAIRY			
			25
	19		
		23	

BLDG SITE ACRES:	CURRENT $/ACRE:		
DAIRY PASTURE VALUE		ACRES:	
FLUID MILK QUOTA (L)			
YEARS IN BUSINESS			
% DAIRY INCOME FROM TOTAL FARM			

APPENDIX E

ALBERTA MILK PRICE FORMULA

Milk sold for consumption in fluid form in Alberta is priced at the producer, wholesale and retail levels by the Public Utilities Board. This is a common procedure in that, for many years, appointed bodies in Canada and the U.S.A. have issued pricing orders designed to ensure adequate supplies of milk for the consuming public. The orders are made following public hearings at which producers, consumer and industry representatives make submission. All systems incorporate some type of quota allocation among milk producers which, when associated with the first grade milk price, provides the incentive to maintain the flow of milk in the cold winter months as well as in the summer.

Formula Pricing

A modification of the above procedure is known as "formula pricing", whereby an equitable price for first grade milk is determined through the use of selected statistical indicators. As milk is considered an essential food in the modern diet, the interests of consumers as well as producers must be considered in the pricing mechanism. Thus an "economic formula", incorporating supply and demand components, is normally used to determine the producer price.

Formula Development in Alberta

In 1973, the Production & Resource Economics Branch designed a formula process to permit a comparison with milk price levels over the previous ten years. It was adopted for experimentation over a 12 month period from August, 1973 to August, 1974. Upon presentation and discussion of the results at a hearing in Red Deer in August 1974, the Public Utilities Board ordered the Formula to be used as a pricing mechanism for a test period of one year starting in October, and to be accompanied with a cost of production program to monitor its suitability and to assess adjustments in the formula components if required at the end of the period.

The Alberta Formula

The Alberta Formula consists of seven statistical factors or components. The first five represent the producer's major cost components and return, and therefore are a reflection of his willingness to sell. The last two represent the approximation of demand of the consumers. The weight given to each factor was established with reference to the actual cost structure on the supply side and relative demand elasticities was a guide for setting the weight of the demand side.

TABLE 1
Components of the Alberta Formula

Components		Weighting
1.	Price of 16% dairy feed $/Tonne (Alberta)	14
2.	Price of Alfalfa Hay $/Ton (Alberta)	14
3.	Index of Farm Wages (Western Canada)	12
4.	Index of Farm Inputs (Western Canada)	20
5.	Index of Consumer Prices (Canada)	10
6.	Average Weekly Industrial Wages (Alberta)	16
7.	Per Capita Sales of Milk Litres/Month (Alberta)	14
	COMPOSITE	100

Application

A base price of $21.04 per hectolitre for No. 1 milk was established as at August, 1973. This was determined from the results of the 1973 Dairy Cost Study and provided for a reurn of 15 per cent on sales income. The indices for the month of August, 1973 were converted to 100, which was then equated to the base price of $21.04. Subsequent monthly index conversions were then calculated relative to the base month, and subsequent monthly producer price levels were determined by multiplying the base price by the appropriate "combined indices".

Whenever the present Formula states a change of $0.49 per hL above or below the existing No. 1 producer price, the Public Utilities Board may make an adjustment of $0.98 to the producer and one cent per litre to the consumer.

Changes in the Formula price are calculated monthly by the Production & Resource Economics Branch and are forwarded to the Public Utilities Board in time to allow for notifications and price list adjustment by the milk processing firms for the succeeding month.

The current formula will be kept under observation and, subject to results of the cost study and observed statistical trends, will be reviewed from time to time.

PRODUCTION & RESOURCE ECONOMICS BRANCH
427-5397